

Web3 Assignment

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INTRODUCTION :

Financial markets are strongly influenced by collective sentiment, especially in highly volatile assets such as cryptocurrencies. This report analyzes how trader behavior changes under different market sentiment regimes—Fear and Greed—using historical trading data combined with the Bitcoin Fear & Greed Index.

The objective of this analysis is to understand how profitability, trading activity, risk exposure, and costs vary with market sentiment and to identify behavioral patterns that could support more informed trading strategies.

DATASETS USED :

Bitcoin Fear & Greed Index

- Columns: Date, Classification (Fear / Greed)
- Purpose: Represents overall market sentiment on a daily basis

Historical Trader Data

- Key Columns:
Account, Coin, Execution Price, Size USD, Side, Timestamp IST, Closed PnL, Fee
- Purpose: Captures individual trade-level behavior and outcomes

DATA PREPARATION AND INTEGRATION :

- The Date column from the sentiment dataset and Timestamp IST from the trader dataset were converted to proper datetime format.
- Timestamps were reduced to daily granularity to allow alignment.
- Both datasets were merged using the common trade_date field.
- Trades without matching sentiment data were removed to ensure consistency.

This resulted in a unified dataset where each trade is labeled with the prevailing market sentiment.

EDA :

AVG PROFIT BY MARKET SENTIMENT :

Bar chart analysis shows a clear difference in profitability between Fear and Greed periods.

Insight:

- Average profits tend to be higher during Greed periods.
- Fear periods show lower or more volatile returns, suggesting cautious or reactive trading behavior.

TRADING ACTIVITY (NO. OF TRADES) :

The number of trades executed under each sentiment regime was compared.

Insight:

- Trading activity is higher during Greed, indicating increased market participation.
- Reduced trade counts during Fear suggest hesitation or reduced confidence among traders.

BUY VS SELL BEHAVIOUR :

A stacked bar chart was used to compare buy and sell trades under different sentiments.

Insight:

- Greed periods show a stronger buy-side dominance.
- Fear periods show relatively higher sell pressure, likely due to panic selling or risk reduction.

TRADE SIZE VS PROFITABILITY :

A scatter plot was used to analyze the relationship between trade size (USD) and profit.

Insight:

- Larger trades are associated with both higher gains and larger losses.
- Risk exposure increases with trade size, especially during Greed-driven market phases.

Fee vs Profit Relationship :

Scatter analysis highlights the impact of transaction fees on profitability.

Insight:

- Higher fees correlate with reduced net profits.
- Frequent or high-volume traders are more sensitive to transaction costs, emphasizing the importance of fee optimization.

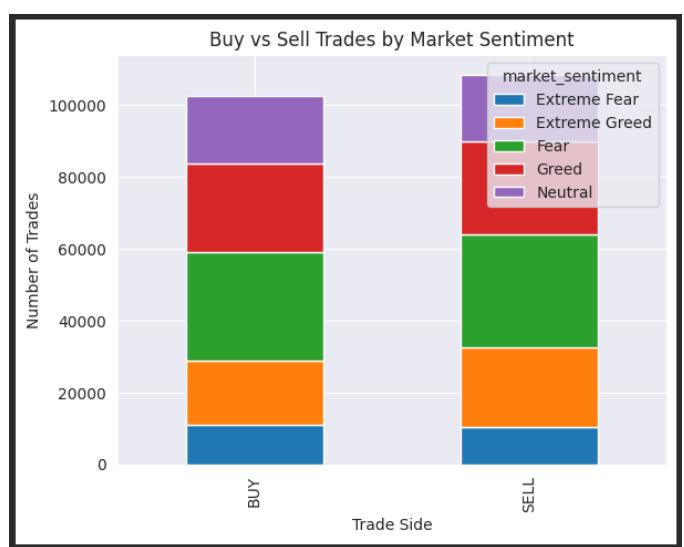
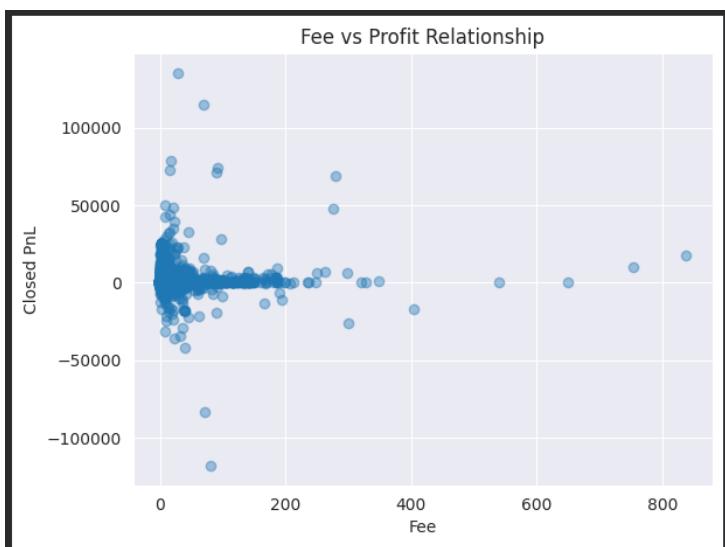
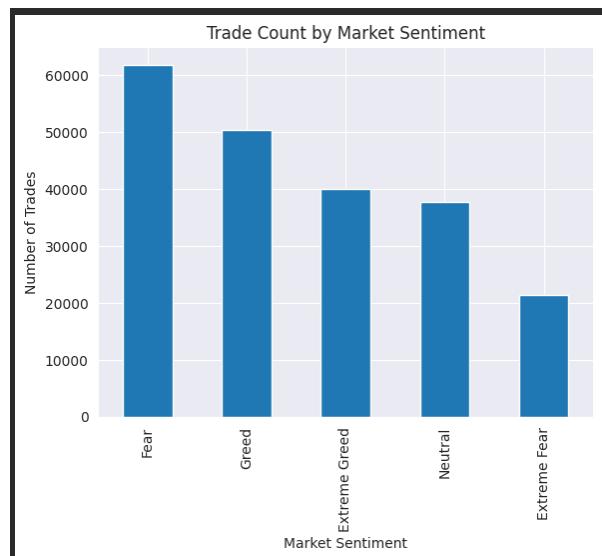
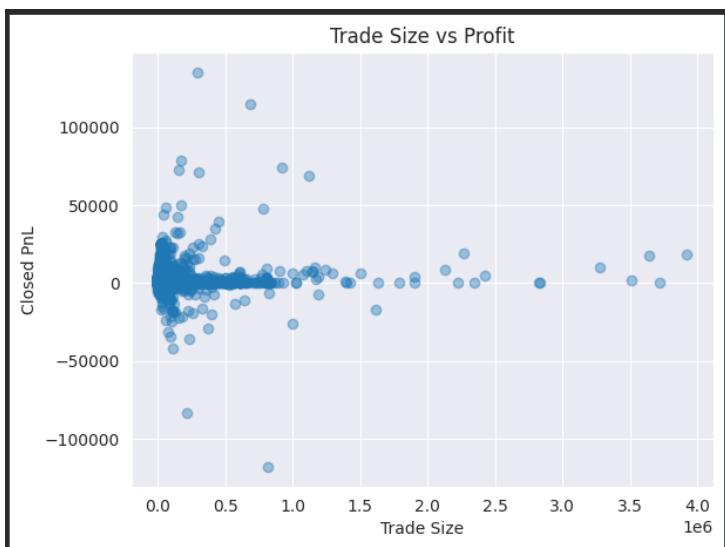
KEY FINDINGS :

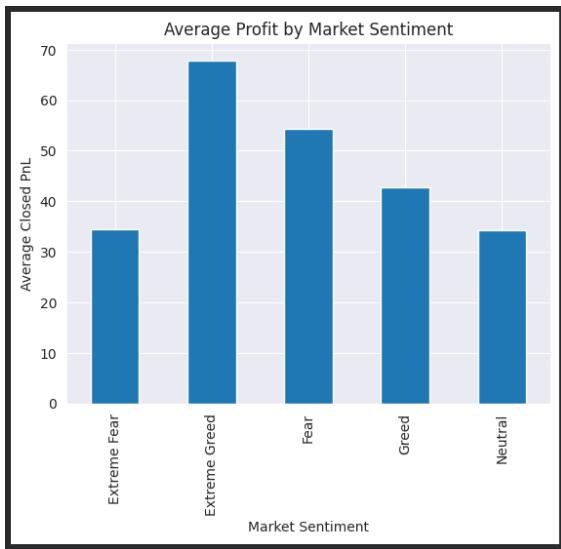
- Traders are generally more profitable during Greed market conditions.
- Market participation and trade frequency increase significantly during Greed.
- Fear-driven markets exhibit lower confidence and defensive behavior.
- Larger trades amplify both profits and losses, increasing risk exposure.
- Transaction fees play a non-trivial role in reducing overall profitability.

STRATEGIC IMPLICATION :

- Sentiment-aware trading strategies can improve decision-making.
- Risk management should be tightened during Greed periods due to increased exposure.
- Fee-aware strategies are critical for high-frequency or large-volume traders.
- Reducing emotional bias during Fear periods may help avoid unnecessary losses.

OUTPUT VISUALIZATIONS :





CONCLUSION :

This analysis demonstrates that trader behavior and performance are strongly influenced by market sentiment. By integrating sentiment indicators with trade-level data, meaningful behavioral patterns emerge that can inform smarter, data-driven trading strategies. Incorporating sentiment awareness into trading systems can enhance profitability, manage risk more effectively, and improve long-term performance.